

IN THE CLAIMS

Please amend the claims as follows:

1. (Withdrawn) An image processing apparatus comprising:

an input unit that inputs color image signals;

a first segmentation unit that determines attributes of a target pixel for the color image signals;

a color component control unit that conducts a predetermined processing to color components of the target pixel based on the attributes of the target pixels determined to thereby generate processed color image signals;

a second segmentation unit that determines attributes of the target pixel for the processed color image signals; and

an image processing unit that conducts an image processing to the processed color image signals based on the attributes of the target pixel determined by the second segmentation unit.

2. (Withdrawn) The image processing apparatus according to claim 1, wherein

the first segmentation unit determines whether the target pixel is any one of a black character pixel and a non-black character pixel based on the attributes of the target pixel,

the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-black character pixel,

the second segmentation unit detects a black character pixel by analyzing at least color components of the processed color image signals, and

the image processing unit conducts the image processing to the processed color image signals based on the black character pixel detected.

3. (Withdrawn) The image processing apparatus according to claim 2, wherein the color component control unit performs an achromatic color pixel generation processing for any one of reducing and removing the color components of the target pixel that is determined by the first segmentation unit to be the black character pixel.

4. (Withdrawn) The image processing apparatus according to claim 1, wherein the first segmentation unit determines whether the target pixel is any one of a colored character pixel and a non-colored character pixel based on the attributes of the target pixel, the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-colored character pixel,

the second segmentation unit detects a colored character pixel by analyzing at least color components of the processed color image signals, and

the image processing unit conducts the image processing to the processed color image signals based on the colored character pixel detected.

5. (Withdrawn) The image processing apparatus according to claim 1, wherein the first segmentation unit determines whether the target pixel is any one of a character pixel and a non-character pixel based on the attributes of the target pixel, the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-character pixel, the second segmentation unit detects a character pixel by analyzing at least color components of the processed color image signals, and

the image processing unit conducts the image processing to the processed color image signals based on the character pixel detected.

6. (Withdrawn) The image processing apparatus according to claim 1, further comprising a storage unit that stores the processed color image signals, wherein

the second segmentation unit determines the attributes of the target pixel based on the processed color image signals stored in the storage unit.

7. (Withdrawn) The image processing apparatus according to claim 1, further comprising:

a compression unit that compresses the processed color image signals to thereby generate compressed processed color image signals;

a storage unit that stores the compressed processed color image signals; and

an expansion unit that expands the compressed processed color image signals stored in the storage unit to thereby generate expanded processed color image signals, wherein

the second segmentation unit determines the attributes of the target pixel based on the expanded processed color image signals stored in the storage unit.

8. (Withdrawn) The image processing apparatus according to claim 7, wherein the compression unit conducts a nonreversible compression processing to the processed color image signals.

9. (Withdrawn) The image processing apparatus according to claim 7, wherein the compression unit converts the processed color image signals to luminance and color difference signals and then compresses the processed color image signals.

10. (Withdrawn) The image processing apparatus according to claim 2, wherein the color component control unit increases the color components upon the color components of the target pixel, attributes of which are determined, being smaller than a predetermined value.

11. (Withdrawn) The image processing apparatus according to claim 2, wherein the color component control unit increases the color components for an image area in which a probability of erroneously detecting the non-black character pixel as the black character pixel is high when the second segmentation unit detects the black character pixel than other areas or for increasing the color components only of the image area in which the probability of erroneously detecting the non-black character pixel as the black character pixel is high.

12. (Withdrawn) The image processing apparatus according to claim 1, wherein the first segmentation unit determines any one of a black character pixel on a white background area and a black line pixel on a white background area as a black character pixel, and

the second segmentation unit determines a pixel, which is in an area adjacent to a white pixel area and which is substantially an achromatic color pixel, as a black character pixel.

13. (Withdrawn) The image processing apparatus according to claim 1, further comprising:

a conversion and transfer unit that

converts the processed color image signals into image signals in a predetermined image format that is designated by one of a system and a user, transfers the image signals in the predetermined image format to an external device, and controls the color component control unit according to the predetermined image format.

14. (Withdrawn) The image processing apparatus according to claim 13, wherein the conversion and transfer unit controls an area of the black character pixel determined by the first segmentation unit to be expanded, as the area subjected to an achromatic color pixel generation processing, to a surrounding area as control over the color component control unit according to the predetermined image format.

15. (Withdrawn) The image processing apparatus according to claim 6, further comprising:

a conversion and transfer unit that converts the processed color image signals stored in the storage unit to image signals in a predetermined image format designated by one of a system and a user, and transfers the image signals in the predetermined image format to an external device, wherein

the conversion and transfer unit comprises a second color component control unit that conducts one of or both of a chromatic color pixel generation processing and an achromatic color pixel generation processing to the processed color image signals stored in the storage unit according to information on the attributes determined from the image signals stored in the storage unit, and

the second color component control unit conducts one of or both of the chromatic color pixel generation processing and the achromatic color pixel generation processing again to the processed color image signals stored in the storage unit according to the information on the attributes determined from the processed color image signals stored in the storage unit, and transfers the resultant image signals to the external device.

16. (Withdrawn) The image processing apparatus according to claim 15, wherein the second color component control unit conducts one of or both of the chromatic color pixel generation processing and the achromatic color pixel generation processing again to the processed color image signals stored in the storage unit according to the attributes of the target pixel determined by the first segmentation unit, and

the conversion and transfer unit transfers the image signals obtained due to the processing by the second color component control unit to the external device.

17. (Withdrawn) The image processing apparatus according to claim 15, wherein the conversion and transfer unit stores a content of the processing conducted to the image signals in header information and transfers the header information to the external device when transferring the image signals to the external device.

18. (Withdrawn) The image processing apparatus according to claim 15, further comprising an input unit that inputs image signals from the external device, wherein the second segmentation unit determines attributes of the image signals input from the external device, and

the conversion and transfer unit controls a black character extraction method executed by the second segmentation unit according to the header information attached to the image signals.

19. (Withdrawn) The image processing apparatus according to claim 15, wherein the storage unit stores image data input from the external device, and if the second segmentation unit reads the image signals stored in the storage unit, detects the attributes of the target pixel, and determines that header information indicating a content of the processing is not attached to the image signals, the conversion and transfer unit controls the second segmentation unit to restrict black character extraction or not to conduct the black character extraction.

20. (Currently Amended) An image processing apparatus, comprising:
an input unit that inputs color image signals; and
a magnification unit that magnifies data of the color image signals input by the input unit, wherein the magnification unit includes,
a first magnification unit that magnifies data of at least one component signal of the color image signals represented by ~~[[the]]~~ a plurality of color component signals, and
a second magnification unit that magnifies data of at least one further component signal of the color image signals, other than the data of the at least one component signal of the color image signals magnified by the first magnification unit, based on a ratio between the data of the at least one component signal of the color image signals to be magnified by the first magnification unit and the data of the at least one further component signal of the color image signals to be magnified by the second magnification unit, and the magnified data of the at least one component signal magnified by the first magnification unit.

21. (Currently Amended) The image processing apparatus according to claim 20, wherein

the predetermined color information includes a ratio of ~~[[a]]~~ data of the plurality of color component signals.

22-23. (Canceled).

24. (Currently Amended) An image processing apparatus, comprising:
an input unit that inputs color difference image signals and luminance signals; and
a magnification unit, wherein the magnification unit includes,
a luminance signal magnification unit that magnifies the luminance signal using a magnification method that interpolates a luminance reference pixel area of ~~wide~~ a first extent,
and

a color difference signal magnification unit that magnifies the color difference signals using a magnification method that interpolates a color reference pixel area of a second extent ~~that is narrower as compared with the luminance reference pixel area~~ first extent, wherein predetermined color information included in the color difference image signals before magnifying the color image signals is retained even after magnifying the color image difference signals.

25. (Canceled).

26. (Previously Presented) The image processing apparatus according to claim 24, wherein the luminance signal magnification unit and the color difference signal magnification

unit magnify corresponding signals by giving weight parameters to peripheral pixels in each corresponding reference pixel area, and

the weight parameters set by the luminance signal magnification unit are different from the weight parameters set by the color difference signal magnification unit.

27. (Previously Presented) The image processing apparatus according to claim 24, wherein

each magnification unit conducts a different magnification setting processing in a longitudinal direction of an image and in a lateral direction of the image.

28. (Withdrawn) An image processing apparatus comprising:

an input unit that inputs color image signals in which code information representing a feature of an image is buried;

a magnification unit that magnifies the color image signals input in such a manner that the code information buried in the color image signals before magnifying the color image signals are retained even after magnifying the color image signals; and

an image processing unit that conducts an image processing to the color image signals magnified.

29. (Withdrawn) The image processing apparatus according to claim 28, wherein the code information includes a predetermined color component in the color image signals.

30. (Withdrawn) The image processing apparatus according to claim 28, wherein

the code information is allocated at least one signal of a plurality of color components in the color image signals as a code signal representing a feature of an image and buried in the at least one signal.

31. (Withdrawn) The image processing apparatus according to claim 28, further comprising a code information recognition unit that recognizes the code information buried in the color image signals input, wherein

the magnification unit magnifies the color image signals according to the code information recognized.

32. (Withdrawn) The image processing apparatus according to claim 28, further comprising:

a segmentation unit that determines an area having a predetermined feature in the color image signals input; and

a code burying unit that buries the code information in the area determined to have the predetermined feature of the color image signals input.

33. (Withdrawn) The image processing apparatus according to claim 28, wherein the magnification unit includes

a first selective processing unit that processes a pixel, in the color image signals, that has the code information buried, in such a manner that the code information is retained even after magnifying the color image signals; and

a second selective processing unit that processes a pixel, in the color image signals, that has no code information buried, in such a manner that the pixel in question is not converted to a pixel having the code information after magnifying the color image signals.

34. (Withdrawn) An image processing system comprising:

- an input unit that inputs color image signals;
- a first segmentation unit that determines attributes of a target pixel for the color image signals;
- a color component control unit that conducts a predetermined processing to color components of the target pixel based on the attributes of the target pixels determined to thereby generate processed color image signals;
- a second segmentation unit that determines attributes of the target pixel for the processed color image signals; and
- an image processing unit that conducts an image processing to the processed color image signals based on the attributes of the target pixel determined by the second segmentation unit.

35. (Withdrawn) The image processing system according to claim 34, wherein

- the first segmentation unit determines whether the target pixel is any one of a black character pixel and a non-black character pixel based on the attributes of the target pixel,
- the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-black character pixel,
- the second segmentation unit detects a black character pixel by analyzing at least color components of the processed color image signals, and
- the image processing unit conducts the image processing to the processed color image signals based on the black character pixel detected.

36. (Withdrawn) The image processing system according to claim 35, wherein the color component control unit performs an achromatic color pixel generation processing for any one of reducing and removing the color components of the target pixel that is determined by the first segmentation unit to be the black character pixel.

37. (Withdrawn) The image processing system according to claim 34, wherein the first segmentation unit determines whether the target pixel is any one of a colored character pixel and a non-colored character pixel based on the attributes of the target pixel, the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-colored character pixel,

the second segmentation unit detects a colored character pixel by analyzing at least color components of the processed color image signals, and

the image processing unit conducts the image processing to the processed color image signals based on the colored character pixel detected.

38. (Withdrawn) The image processing system according to claim 34, wherein the first segmentation unit determines whether the target pixel is any one of a character pixel and a non-character pixel based on the attributes of the target pixel,

the color component control section increases the color components of the target pixel upon the first segmentation unit determining that the target pixel is the non-character pixel,

the second segmentation unit detects a character pixel by analyzing at least color components of the processed color image signals, and

the image processing unit conducts the image processing to the processed color image signals based on the character pixel detected.

39. (Withdrawn) The image processing system according to claim 34, further comprising a storage unit that stores the processed color image signals, wherein the second segmentation unit determines the attributes of the target pixel based on the processed color image signals stored in the storage unit.

40. (Withdrawn) The image processing system according to claim 34, further comprising:

a compression unit that compresses the processed color image signals to thereby generate compressed processed color image signals;

a storage unit that stores the compressed processed color image signals; and

an expansion unit that expands the compressed processed color image signals stored in the storage unit to thereby generate expanded processed color image signals, wherein

the second segmentation unit determines the attributes of the target pixel based on the expanded processed color image signals stored in the storage unit.

41. (Withdrawn) The image processing system according to claim 40, wherein the compression unit conducts a nonreversible compression processing to the processed color image signals.

42. (Withdrawn) The image processing system according to claim 40, wherein the compression unit converts the processed color image signals to luminance and color difference signals and then compresses the processed color image signals.

43. (Withdrawn) The image processing system according to claim 35, wherein the color component control unit increases the color components upon the color components of the target pixel, attributes of which are determined, being smaller than a predetermined value.

44. (Withdrawn) The image processing system according to claim 35, wherein the color component control unit increases the color components for an image area in which a probability of erroneously detecting the non-black character pixel as the black character pixel is high when the second segmentation unit detects the black character pixel than other areas or for increasing the color components only of the image area in which the probability of erroneously detecting the non-black character pixel as the black character pixel is high.

45. (Withdrawn) The image processing system according to claim 34, further comprising:

a conversion and transfer unit that

converts the processed color image signals into image signals in a predetermined image format that is designated by one of a system and a user,

transfers the image signals in the predetermined image format to an external device, and

controls the color component control unit according to the predetermined image format.

46. (Withdrawn) The image processing system according to claim 39, further comprising:

a conversion and transfer unit that converts the processed color image signals stored in the storage unit to image signals in a predetermined image format designated by one of a system and a user, and transfers the image signals in the predetermined image format to an external device, wherein

the conversion and transfer unit comprises a second color component control unit that conducts one of or both of a chromatic color pixel generation processing and an achromatic color pixel generation processing to the processed color image signals stored in the storage unit according to information on the attributes determined from the image signals stored in the storage unit, and

the second color component control unit conducts one of or both of the chromatic color pixel generation processing and the achromatic color pixel generation processing again to the processed color image signals stored in the storage unit according to the information on the attributes determined from the processed color image signals stored in the storage unit, and transfers the resultant image signals to the external device.

47. (Withdrawn) An image processing method comprising:

inputting color image signals;

determining attributes of a target pixel for the color image signals;

conducting a predetermined processing to color components of the target pixel based on the attributes of the target pixels determined to thereby generate processed color image signals;

determining attributes of the target pixel for the processed color image signals; and

conducting an image processing to the processed color image signals based on the attributes of the target pixel determined for the processed color image signals.

48. (Withdrawn) The image processing method according to claim 47, wherein the determining attributes of a target pixel for the color image signals includes determining whether the target pixel is any one of a black character pixel and a non-black character pixel based on the attributes of the target pixel,

the predetermined processing includes increasing the color components of the target pixel upon it is determined at the determining attributes of a target pixel for the color image signals that the target pixel is the non-black character pixel,

the determining attributes of the target pixel for the processed color image signals includes detecting a black character pixel by analyzing at least color components of the processed color image signals, and

the conducting the image processing includes processing the processed color image signals based on the black character pixel detected.

49. (Withdrawn) The image processing apparatus according to claim 48, wherein the conducting the predetermined processing includes performing an achromatic color pixel generation processing for any one of reducing and removing the color components of the target pixel that is determined at the determining attributes of a target pixel for the color image signals to be the black character pixel.

50. (Withdrawn) The image processing method according to claim 47, wherein the determining attributes of a target pixel for the color image signals includes determining whether the target pixel is any one of a colored character pixel and a non-colored character pixel based on the attributes of the target pixel,

the predetermined processing includes increasing the color components of the target pixel upon it is determined at the determining attributes of a target pixel for the color image signals that the target pixel is the non-colored character pixel,

the determining attributes of the target pixel for the processed color image signals includes detecting a colored character pixel by analyzing at least color components of the processed color image signals, and

the conducting the image processing includes processing the processed color image signals based on the colored character pixel detected.

51. (Withdrawn) The image processing method according to claim 47, wherein the determining attributes of a target pixel for the color image signals includes determining whether the target pixel is any one of a character pixel and a non-character pixel based on the attributes of the target pixel,

the predetermined processing includes increasing the color components of the target pixel upon it is determined at the determining attributes of a target pixel for the color image signals that the target pixel is the non-character pixel,

the determining attributes of the target pixel for the processed color image signals includes detecting a character pixel by analyzing at least color components of the processed color image signals, and

the conducting the image processing includes processing the processed color image signals based on the character pixel detected.

52. (Currently Amended) An image processing method, comprising:
inputting color image signals; and

magnifying data of the color image signals input in such a manner that predetermined color information included in the data of the color image signals before magnifying the data of the color image signals are retained even after magnifying the data of the color image signals, wherein the magnifying step includes,

separately magnifying data of at least a first component signal of the color image signals represented by ~~[[the]]~~ a plurality of color component signals, and

separately magnifying data of at least a second component signal of the color image signals, which is different from the at least the first component signal of the color image signals, based on a ratio between the data of the at least the first component signal of the color image signals and the data of the at least the second component signal of the color image signals, and the magnified data of the at least the first component signal magnified in the step of separately magnifying data of at least the first component signal.

53. (Currently Amended) The image processing apparatus according to claim 52, wherein

the predetermined color information includes a ratio of ~~[[a]]~~ data of the plurality of color component signals.

54-55. (Canceled).

56. (Currently Amended) An image processing method, comprising:

inputting color difference image signals and luminance signals;

magnifying the luminance signal using a magnifying method including interpolating a luminance reference pixel area of ~~wide~~ a first extent; and

magnifying the color difference image signals using a magnifying method including interpolating a reference pixel area of a second extent ~~that is narrower than the wide reference pixel area~~ first extent so that predetermined color information included in the color image difference signals is retained even after magnifying the color difference signal.

57. (Canceled).

58. (Previously Presented) The image processing method according to claim 56, including magnifying the luminance signal and the color difference image signal by giving weight parameters to peripheral pixels, and

the weight parameters for the luminance signal are different from the weight parameters for the color difference image signal.

59. (Previously Presented) The image processing method according to claim 56, wherein the magnifying of the luminance signal and the color difference image signal includes magnifying each of the luminance signal and the color difference image signal separately in each of two different directions of an image.

60. (Withdrawn) An image processing method comprising:

inputting color image signals in which code information representing a feature of an image is buried;

magnifying the color image signals input in such a manner that the code information buried in the color image signals before magnifying the color image signals are retained even after magnifying the color image signals; and

conducting an image processing to the color image signals magnified.

61. (Withdrawn) The image processing method according to claim 60, wherein the code information includes a predetermined color component in the color image signals.

62. (Withdrawn) The image processing method according to claim 60, wherein the code information is allocated at least one signal of a plurality of color components in the color image signals as a code signal representing a feature of an image and buried in the at least one signal.

63. (Withdrawn) The image processing method according to claim 60, further comprising recognizing the code information buried in the color image signals input, wherein the magnifying includes magnifying the color image signals according to the code information recognized.

64. (Withdrawn) The image processing method according to claim 60, further comprising:

determining an area having a predetermined feature in the color image signals input;
and

burying the code information in the area determined to have the predetermined feature of the color image signals input.

65. (Withdrawn) The image processing method according to claim 60, wherein the magnifying includes

processing a pixel, in the color image signals, that has the code information buried, in such a manner that the code information is retained even after magnifying the color image signals; and

processing a pixel, in the color image signals, that has no code information buried, in such a manner that the pixel in question is not converted to a pixel having the code information after magnifying the color image signals.